

A person in a dark suit and red tie is walking past a large window. The window reflects various international flags, including the German flag, the Dutch flag, and the Finnish flag. The person is carrying a black bag. The background is a blurred view of a building and some bare trees.

Needs and wishes of alumni and employers

Research into the requirements of the labour market for international competencies in the Bachelor programme HBO ICT of The Hague University of Applied Sciences

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Summary

The Hague University of Applied Sciences has high ambitions in the field of internationalisation. Two out of four priorities in the institutional policy touch this theme: global citizenship and internationalisation. In order to ensure that the curriculum of the new degree programme HBO ICT meets these priorities, it is interesting to know which international competencies the ICT sector requires.

The main research questions in this report is: Which international competencies does the ICT sector demand of ICT graduates and how can these be embedded in the curriculum of the new HBO ICT degree programme? That the question is relevant, is shown by the fact that 25% of the respondents, ICT graduates, indicated that they actually work abroad for longer and shorter periods.

In this research an online survey was held among alumni (n = 315) of the precursors of the HBO ICT degree programme in order to find out which international competencies are important. By conducting interviews on the same target group, this information was deepened. In an online survey among graduation supervisors (n = 202) it is examined to what extent the graduates master the required skills by the end of their training. This combined information provides the input to develop the new curriculum of the HBO ICT degree programme and its specialisations.

The results show that English and especially English listening and reading skills are considered to be very important. Our alumni master these skills highly satisfactorily. It was specifically mentioned, however, that alumni must overcome a certain reluctance to speak. Intercultural and personal and social competencies are found very important. To master these competencies, students should learn by experiencing. This can be done by working together in international teams, but also in national teams as long as they are supervised explicitly on intercultural, personal and social competencies. As far as the international academic and professional competencies concerned, especially internationally accepted professional knowledge is considered important. On these categories the HBO ICT graduates score satisfactorily (a score of 6 or 6,5 out of 10). Depending on the ambitions of the programme, some improvements could be made here.

In general, the ICT sector is quite satisfied with the extent to which our students possess international competencies they consider to be relevant. However, there are suggestions for improvement and some of them have already been included in the toolkit internationalisation as part of the development of the curriculum of HBO ICT.

1. Introduction

Internationalisation has become an integral part of our society. The job market is becoming increasingly international, with international opportunities and international competition. For every 100 euros we earn in the Netherlands, 32 euros is earned from the export of goods and services (CBS, 2015). Emerging markets like India, China and Russia are moving towards greater economic power. Global challenges demand global solutions. Various forms of migration have resulted in considerable cultural diversity within nations. Societies and job markets are undergoing change as a result. To deal with these social changes effectively and succeed in the current job market, graduates need to be equipped with international competencies (Funk, Den Heijer, Schuurmans & Walenkamp, 2014).

The world of ICT is no different: an iPad is designed in the United States, produced in Asia with raw materials from Africa and sold in Europe. The world's largest Internet junction is found in the Netherlands: the Amsterdam Internet Exchange (AMS-IX), an important driving force for the Dutch economy. Country borders are becoming less relevant and the nature of the work carried out by those working in ICT is changing as a result. International competencies are the determining factors for successful global entrepreneurship and innovation, making them essential for the international competitive position of the Netherlands (Wit & Beelen, 2011). Universities of applied sciences and research universities need to prepare students for an international professional future.

How likely are you to focus solely on the Netherlands? The entire market has become so international that odds are your focus will not be on just the Netherlands. We are part of the EU, which means that the Netherlands does not stand alone.

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The Hague University of Applied Sciences is also undertaking internationalisation. In the institution plan 2020, The Hague University of Applied Sciences has included high ambitions for the focal areas of World Citizenship and Internationalisation (Institution Plan for The Hague University of Applied Sciences, 2014-2020). Moreover, the chairman of the Executive Board aims to make The Hague University of Applied Sciences the most international university of applied sciences in the Netherlands. High ambitions in terms of internationalisation have been developed further in a university-wide internationalisation policy (Global citizens in a learning society: Internationalisation at THUAS 2015-2020). One of the ten critical elements of internationalisation included in the THUAS compass within this project is the internationalisation of curricula.

In September 2015, the five ICT degree programmes at The Hague University of Applied Sciences will be merged into a single programme: HBO ICT (The Hague Bachelor Programme ICT). The goal is to develop an HBO ICT programme with an international orientation, to prepare students to become ICT T-shaped professionals able to work in a continuously changing international and multicultural environment. An ICT T-shaped professional is a subject expert and is able to think, communicate and act within and beyond his or her specialisation (HBO ICT Bachelor: vision 2018). Internationalisation plays an important role in this degree programme. How can we best implement this internationalisation strategy?

Various studies have already been carried out into how to internationalise curricula. Leask (2013; 2015), for example, describes how the internationalisation of curricula is a planned and cyclical development process in which the powers of imagination play an important role. Childress (2010) emphasises the importance of involving the lecturers in the internationalisation process and makes a distinction between a number of enablers and blockers. In 'Internationalisation of the Curriculum in Action: A Guide', Leask (2012) describes how internationalisation in higher education can be inter-

preted and integrated in various ways. Her ‘conceptual framework’ visualises the various layers of context and how each layer can affect how employees think about internationalisation. One of the important aspects that affect curriculum design are the requirements placed on graduates as professionals and citizens in an international society.



Figure 1: A conceptual framework for internationalisation of the curriculum (Leask, 2015)

Funk, Den Heijer, Schuurmans & Walenkamp (2014) have conducted research into the competencies that alumni and employers require of graduates of The Hague University of Applied Sciences. But to engage the lecturers of the HBO ICT degree programme, it is important that they be able to identify with the research results. After all, what may hold true for a programme like European Studies does not necessarily apply to HBO ICT. That is why it is important that research into international competencies is conducted specifically among ICT alumni and employers, in addition to the research already carried out university-wide.

This study lays the foundation for the internationalisation of the learning outcomes of the HBO ICT programme. The goal of this study is to provide input on the development of the internationalised curriculum for the HBO ICT Bachelor's programme. The main research questions is: Which international competencies does the ICT sector demand of ICT graduates and how can these be embedded in the curriculum of the new HBO ICT degree programme?

The following sub-questions are intended to elicit an answer to the main research question formulated above.

1. Which international competencies are important to the ICT sector?
 - To what degree will ICT alumni of The Hague University of Applied Sciences have to contend with internationalisation?
 - Which international competencies are important to alumni?
 - Which international competencies are important to graduate supervisors?
2. How should international competencies be embedded in the curriculum of the new HBO ICT degree programme?
 - To what degree do the current degree programmes contribute to the development of international competencies among students?
 - What changes should be implemented in the HBO ICT curriculum to meet the demand for international competencies?

2. Research method

2.1 International competencies

This study defines international competencies as described in the study “Internationalizing curricula. Needs and wishes of alumni and employers with regard to international competencies” (Funk, Den Heijer, Schuurmans & Walenkamp, 2014) study. In this study, international competencies consist of:

- Intercultural competencies
- International academic and professional competencies
- Foreign language knowledge
- Country knowledge
- Interpersonal and social competencies

Based on a number of interviews with people working in the field of ICT, two competencies have been added to the existing set of international competencies, namely:

- Knowledge of and experience with online collaboration
- Specific subject knowledge and skills

Both competencies fall under the category of ‘international academic and professional competencies’. This study uses existing information and a combination of quantitative and qualitative research methods: online surveys and interviews. The combination of quantitative and qualitative research methods yields greater insight into the problem definition (Baarda, De Goede and Teunissen, 2009). The online surveys make it possible to collect a large amount of data among the target group, while interviews help to interpret and assign meaning to the results. This research method is in line with the study ‘Internationalizing curricula’ (Funk, Den Heijer, Schuurmans & Walenkamp, 2014) carried out in the past within the Research Group International Cooperation.

2.2 Target group

In this study, the ICT sector consists of alumni and graduate supervisors within the graduation project company. Alumni already working in the ICT field know better than anyone which international competencies are important in their work. Since they have personally experienced how the degree programmes are structured, they can also clearly indicate what kinds of changes to the curriculum would benefit from the acquisition of international competencies. To assess the degree to which graduates possess international competencies at the end of the programme based on the current curriculum, an online survey was sent to the graduate supervisors within the graduation project company where the

ICT students of The Hague University of Applied Sciences did their graduation placement. Thanks to their work experience, they are able to assess which international competencies are important and the degree to which students have mastered these competencies based on the current curriculum. The reason why graduation supervisors were chosen for this study is that this group is able to evaluate the extent of competency development at the end of the degree programme. An alumnus who has been working for a number of years may have acquired his or her international competencies in the years following graduation.

2.3 Online surveys

The international competencies consisting of intercultural competencies, international academic and professional competencies, foreign language knowledge, country knowledge and interpersonal and social competencies were developed specifically for the ICT sector based on literature and interviews with professionals working in the ICT.

The goal of the online survey is to gain insight into:

1. The international competencies that are important for ICT graduates.
2. The degree to which HBO ICT students have mastered international competencies by the end of their degree programme at The Hague University of Applied Sciences.
3. The changes that should be implemented in the HBO ICT curriculum to meet the demand for international competencies.

To adequately answer these questions, two online surveys were developed, one for alumni and one for graduation supervisors of ICT graduates from The Hague University of Applied Sciences. A graduate is usually supervised by two persons: a lecturer from the degree programme and a company mentor. The term graduation supervisor is understood here to mean the company mentor during the graduation project. The survey for alumni primarily answers questions 1 and 3, while the online survey for graduation supervisors provides answers to questions 1 and 2.

The online survey for alumni consisted of four parts: questions about the degree programme that the alumnus has attended, questions about his or her current position, questions about the importance of international competencies and questions about any changes that should be made to the curriculum. The first two parts are important to give meaning to parts three and four. For the questions regarding international competencies, the respondents were first asked what they understood by international competencies. After explaining how international competencies are defined in this study, they were then asked to rate the degree of importance of each competency based on their work experience on a five-point scale (very important, important, neutral, unimportant, very unimportant). To keep the answers given as honest as possible, the questions were not mandatory: if a respondent was unable to assess the importance of something, he or she did not have to answer the question. For the questions about how international competencies can be integrated into the education, the respondents were asked to indicate how meaningful they found the proposals on a five-point scale (very meaningful, meaningful, neutral, meaningless, completely meaningless). At the end of the survey, the respondents were asked whether they were willing to take part in an interview to clarify their responses in more detail.

The online survey for graduation supervisors within a company consisted of three parts. Parts one and two consisted of questions about the respondent and his or her position, as well as questions about the graduate. In part three, the graduate supervisor is asked to indicate the importance of the various competencies and degree to which the graduate already masters these international competencies for every competency on a five-point scale. The scale consists of a score: 1-2, 3-4, 5-6, 7-8, 9-10. Once again, the questions in part three were not mandatory, so that the respondent did not have to

answer a question if it was not relevant to his or her experience. To prevent that only 'internationalisation-minded' respondents completed the questionnaire, the introduction email mentioned the new HBO ICT degree programme under development, but not the internationalisation goals. To approach both Dutch and English-speaking graduate supervisors, the online survey was translated into English and respondents were given the choice to answer the questions in Dutch or English. At the end of the survey, the respondents were asked whether they were willing to take part in an interview to clarify their responses in more detail.

Representativeness

The research group consists of alumni of the Faculty of IT & Design of The Hague University of Applied Sciences and graduate supervisors at companies where ICT students of The Hague University of Applied Sciences did their graduate placement. The alumni were approached via The Hague University of Applied Sciences alumni database, in which the alumni personally agreed to be included. A total of 1,170 alumni were approached and 317 alumni completed the online survey (27%). Of these 317 completed questionnaires, 315 were usable. The graduate supervisors who were approached for participation in the survey were listed in the database kept by the ICT&Media@work unit. This database offers the option of whether or not to receive general mailings. Contact persons who indicated that they do not wish to receive general mailings were not approached for the survey. A total of 1,026 supervisors were approached and 271 responses received (26%). This database does not distinguish between the third-year placement and graduation placement, so the survey included a question regarding the placement year. Only those respondents who indicated a graduation placement completed the entire survey. This was a total of 202 respondents.

To determine the degree of representativeness of the respondents, the extent to which the characteristics of the respondents corresponded to the persons contacted and the total research population was examined. The total research population consists of alumni of the current degree programmes and their precursors. The data from Osiris¹ dates back to 1988.

Programme	Total graduate database (1988-2014)	Alumni contacted	Respondents
Information Technology	562	401	75
Business IT & Management (and precursors)	606	293	58
Information Services & Management	506	151	46
Computer Science	371	209	53
Information Security Management	52	22	1
Information Technology and Information Science	3343	124	82
Total Male	4719		
Total Female	721		

Table 1: Representativeness of respondents compared to total research population

1 The student tracking system used at The Hague University of Applied Sciences

With the development of the HBO ICT, the degree programmes have different specialisations and, consequently, different names. The names of the programmes have been maintained in the results section since alumni were asked to provide input on the programme in which they were enrolled. This information provides one-on-one input on the specialisations of HBO ICT. In the discussion and conclusion sections of this report, the names of the specialisations are maintained because the findings provide input on the development of the new HBO ICT programme and its specialisations. They have been translated as follows:

Name of degree programme	Name of specialisation
Information Technology (INF)	Software Engineering (SE)
Business IT & Management (BIM)	Business & Management (B&M)
Computer Science (TI)	Network & Systems Engineering (NSE)
Information Services & Management (IDM)	Information & Media Studies (IMS)
Information Security Management (ISM)	Information Security Management (ISM)

Table 2: Translation of degree programme (alumni) to specialisation in HBO ICT

2.4 Interviews

The goal of the interviews held among the alumni was threefold:

1. Greater insight into the significance of international competencies in the work of an ICT professional
2. Better interpretation of specific information from the questionnaire
3. Insight into the extent to which having international competencies plays a role in the hiring policy at ICT companies

A select sample of 17 respondents of those respondents who indicated in the survey that they were willing to take part in an interview were contacted based on the programme in which they were enrolled, graduation year and attitude towards the importance of international competencies. Alumni of every programme are represented in the select sample, including a recent graduate and a graduate from more than 10 years ago, both men and women who feel that international competencies are very important and people who were more critical in their responses to the questions in the online survey. Nine people ultimately responded and these nine were interviewed by means of semi-structured interviews.

2.5 HBO Monitor

The HBO Monitor is an online survey held nationwide each year among alumni who graduated around one-and-a-half years ago. The information from the HBO Monitor for the years 2009-2013 is used to determine where students end up career-wise, the extent to which students feel that their programme devoted attention to international competencies, the degree to which they master these competencies and the extent to which they require them in their work. A comparison between the data in the HBO Monitor and the responses to the questionnaire for alumni is an effective indicator of the reliability and validity of the results of this study.

3. Results

This chapter provides an answer to the research questions based on the results of online surveys held among alumni and graduate supervisors, interviews with alumni and the HBO Monitor. General information is provided initially, followed by a detailed examination of a question or sub-question.

3.1 General information

This section contains general information on the respondents that can be used for the analyses.

Which degree programme did you do?

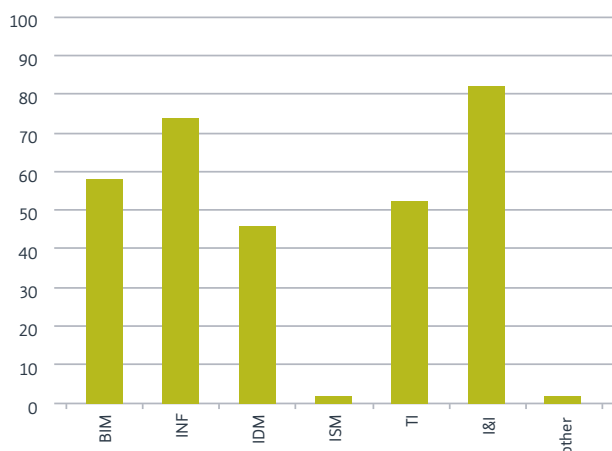


Figure 2: Number of respondents per degree programme

For the question 'In which degree programme were you enrolled?', respondents could select from the categories above. A group of 17 respondents initially responded 'Other'. Insofar as the 'other' programme was a precursor of the current programme, it was grouped under the current programme. Information Technology and Information Science (I&I) is the only category that remains the same since it is a precursor to the combination of Information Technology and Business IT & Management. The Information Provision and Information Technology (IVIT) programme was added to the I&I category.

In which year did you graduate?

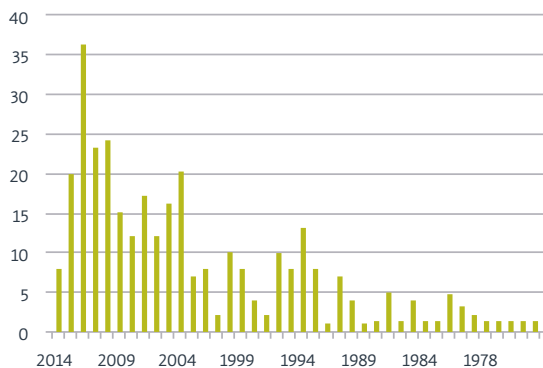


Figure 3: Number of respondents per graduation year

The table above shows that recent graduates were more likely to complete the online survey. The large group of recent graduates (2007-2014) are primarily alumni of the current degree programmes. Students of the current programmes who graduated between 1975 and 2000 were enrolled in a precursor to the current programmes. The large group of I&I alumni graduated between 1990 and 2002.

Figure 4 shows that the largest group of graduates (71 per cent) did not enrol in post-graduate programmes. The distribution among the various programmes is consistent here. Of those who enrolled in a programme after completing the programme at a university of applied sciences, 41 per cent chose a programme with an international focus (either in the Netherlands or abroad).

Did you enrol in a degree programme after graduating from The Hague University of Applied Sciences?

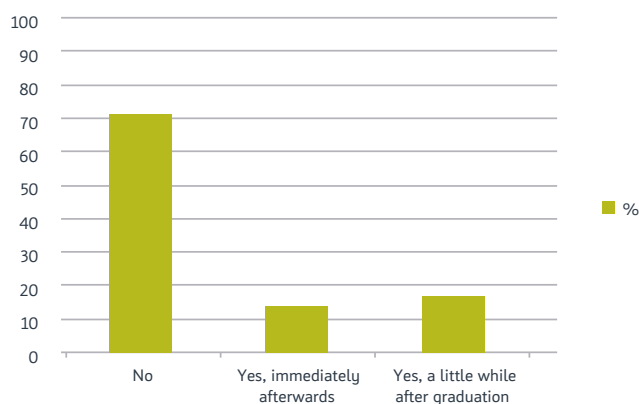


Figure 4: Percentage of alumni respondents who enrolled in a post-graduate programme after graduating

Figure 5 shows the types of companies that hire our alumni. IDM students end up relatively often in the public sector, while TI, INF and I&I and ISM alumni often opt for the private sector. The TI, INF and I&I alumni also often decide to start their own company. BIM alumni are divided fairly evenly among private and public companies.

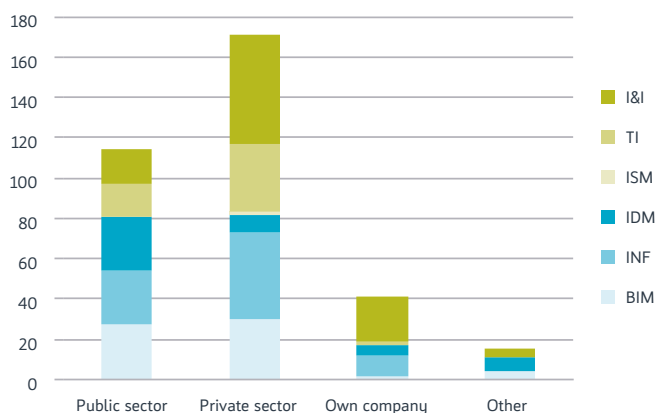


Figure 5: Type of companies that hire alumni per degree programme

More than half of the alumni (52 per cent) work at a large company (> 250 FTE). BIM and ISM students end up at a large company relatively often, while INF students end up working at a small or very small company relatively often. This is divided fairly evenly for the other degree programmes.

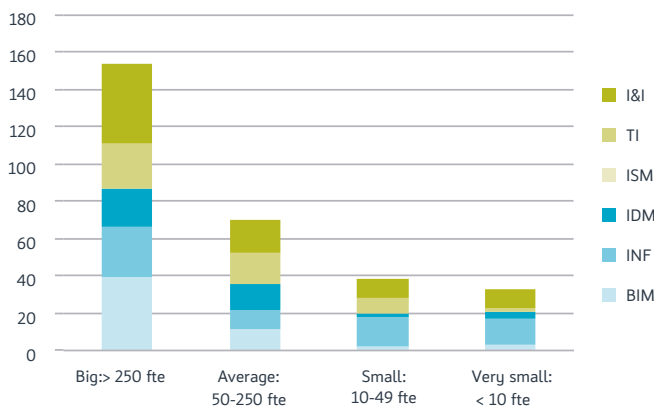


Figure 6: Size of companies that hire alumni per degree programme

3.2 Which international competencies are important to the ICT sector?

This question is answered in three sub-questions. The initial aim was to examine ways in which ICT alumni have to contend with internationalisation, followed by which international competencies are considered important. A distinction is made here between alumni and graduate supervisors.

3.2.1 To what degree will ICT alumni of The Hague University of Applied Sciences have to contend with internationalisation?

The question as to the degree to which ICT alumni have to contend with internationalisation was answered using questions from the online survey for alumni and the HBO monitor. The various tables and graphics are shown first, while the final section combines the data to answer the question.

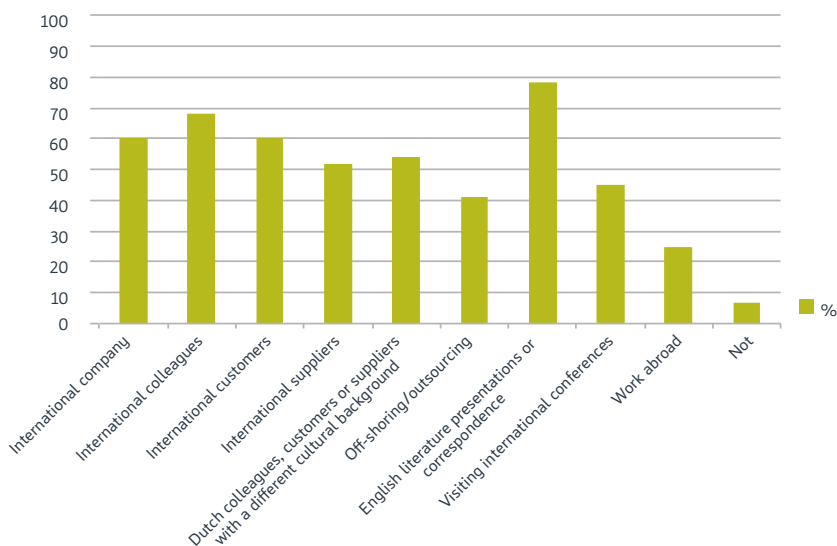


Figure 7: Degree to which respondents have had to contend with internationalisation

Figure 7 shows the degree to which our alumni have had to contend with internationalisation. One-fourth of alumni (25 per cent) indicated that they work or have worked abroad. More than half of alumni (56 per cent) work for an international company or indicated having international colleagues (68 per cent), international customers (60 per cent) or international suppliers (52 per cent). Only 7 per cent indicated not having to contend with internationalisation at all. Part of this 7 per cent are still enrolled in a post-graduate programme. Of this 7 per cent who indicated not having to contend with internationalisation, one respondent did indicate having to deal with English-language literature, presentations or correspondence and another indicated that, in addition to the above, he or she also had to deal with international customers.

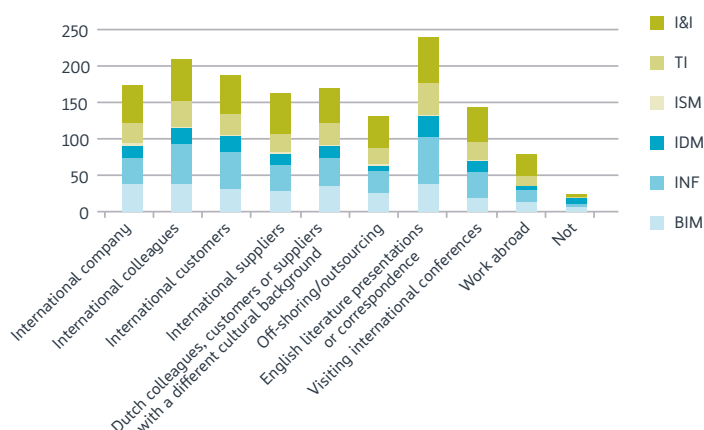


Figure 8: Degree to which respondents have had to contend with internationalisation per degree programme

Figure 8 shows that there are no appreciable differences between the various degree programmes in the degree to which alumni have had to contend with internationalisation. This corresponds to the findings of Funk et al. (2014).

Geographic scope of organisation's activities

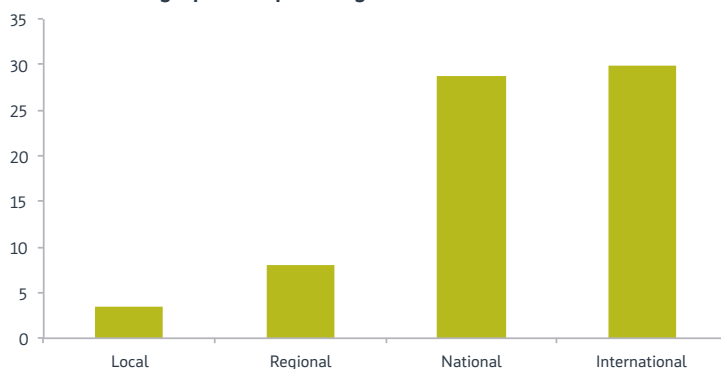


Figure 9: Geographic scope of organisation's activities (HBO Monitor)

The HBO Monitor shows that 29.9 per cent of alumni of the Faculty of IT & Design work at an organisation that operates internationally. According to the HBO Monitor, the number of alumni actually living and working abroad one-and-a-half years after graduating is limited, at only 1.7 per cent. Those whose place of work is in the Netherlands and travel abroad occasionally are not included here.

A total of 25 per cent of the respondents in the online survey indicated having worked abroad at some point, while the results of the HBO Monitor show that 1.7 per cent of respondents work abroad perma-

nently and 29.9 per cent work for an internationally operating organisation. The difference may lie in 'permanently' versus 'occasionally'. It is more likely in the ICT world that people occasionally travel abroad for work. Another explanation may be that the HBO Monitor is conducted among alumni who graduated a year-and-a-half ago: it may be that alumni will start working more internationally later in their career. This is confirmed by interviews and because the alumni of the I&I programme, a somewhat older programme that has since been scaled down and of which the largest group of respondents graduated between 1991 and 2006, have a relatively stronger focus on international competencies.

"Everything takes place in English here. All reports that may be viewed at some point by other teams are written in English."

ALUMNUS INTERVIEW, MAY 2015

Based on the information above, the following conclusion can be made. The online survey conducted among alumni shows that 93 per cent of alumni have had to contend with internationalisation as part of their job in one way or another. The most common forms of internationalisation are English-language professional literature, presentations or correspondence, international customers and international colleagues. There is little difference among the various ICT degree programmes as to the degree to which alumni have to contend with internationalisation. A total of 25 per cent of respondents indicated working abroad occasionally, while the HBO Monitor results show that 1.7 per cent of respondents work abroad permanently and 29.9 per cent work for an internationally operating organisation.

"To stay fully up-to-date, you will also have to read articles in English."

ALUMNUS INTERVIEW, MAY 2015

3.2.2 Which international competencies are important to alumni?

To gain insight into the importance of the formulated competencies, alumni were asked to indicate how important they find each competency based on their own work experience. The graphs below show how often each competency received each score for each category. The graphs are ranked by the degree of importance, with those competencies rated more important at the top based on the average score. The explanatory text under the graph indicates the average score on the Likert scale for each competency.

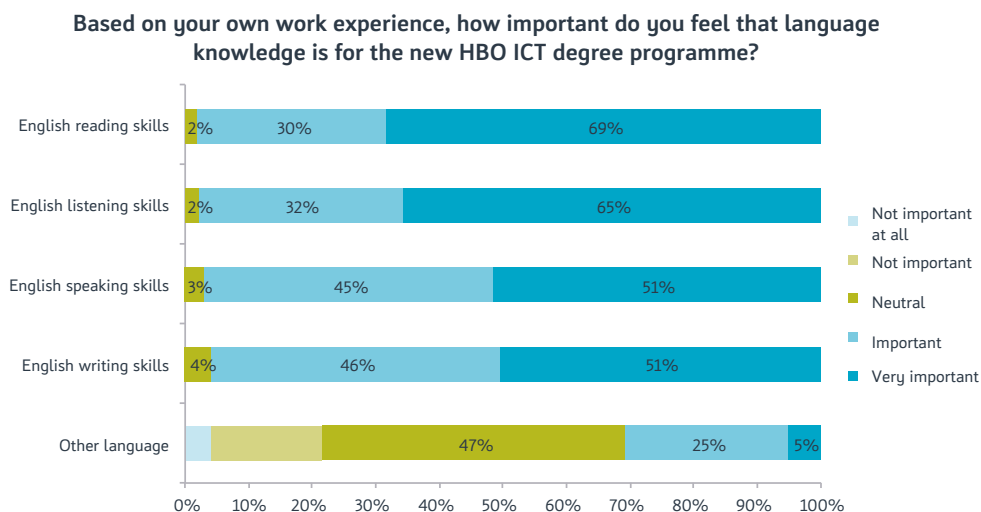


Figure 10: Importance of language knowledge for HBO ICT according to alumni

English was generally found to be important to very important, with English reading skills (4.67) and English listening skills (4.63) were considered slightly more important than English speaking (4.48) and writing skills (4.47). Languages other than English were found to be considerably less important (3.11).

“International competencies are increasingly important here. You won’t get hired, for instance, if you don’t speak English.”

ALUMNUS INTERVIEW, MAY 2015

The HBO Monitor indicates that 9.4 per cent of graduates do not require English in their current position. The largest group (38.5 per cent) indicates that the required level is above average, while 32.1 per cent of jobs require an average level and 11.1 per cent an excellent level.



Figure 11: Required level of English language skills in current position (HBO Monitor)

Those respondents who indicated that a language other than English is important or very important were asked what language that was.

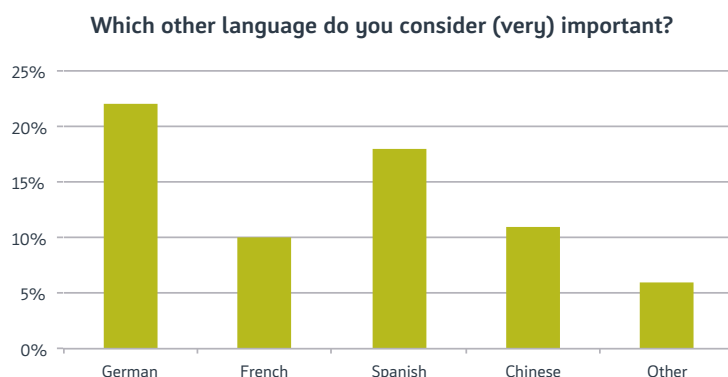


Figure 12: Importance of language other than English

Various languages were mentioned via the ‘Other’ category: depends on the field of work (4 times), Russian (3 times), Polish (2 times), Arabic (2 times), Portuguese, Hindi, Ukrainian, Japanese, Spanish and it does not matter, since every language increases your insight.

Based on your own work experience, how important do you feel that personal and social competencies are for the new HBO ICT degree programme?

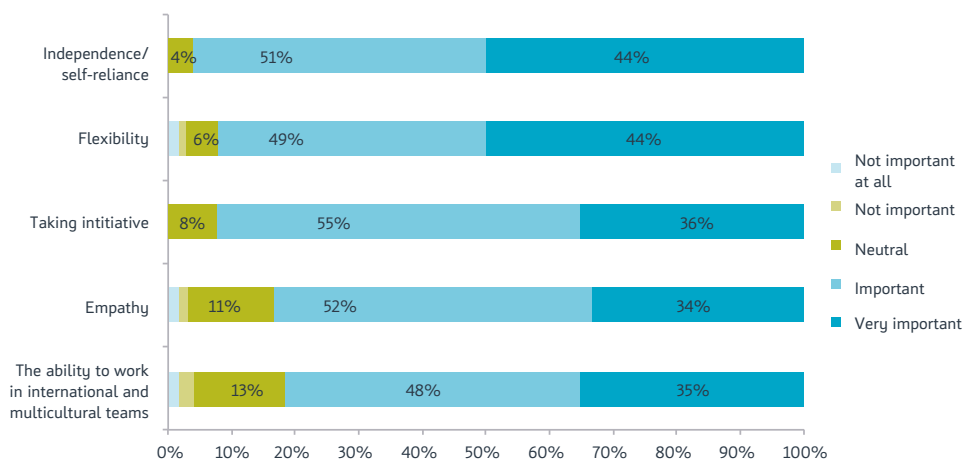


Figure 13: Importance of personal and social competencies for HBO ICT according to alumni

Generally speaking, personal and social competencies are considered important to very important. The competencies that received the highest scores are independence/self-reliance (4.38) and flexibility (4.35), followed closely by taking initiative (4.27), empathy (4.19) and the ability to work in international and multicultural teams (4.15).

“What I have experienced most often on the international front is that you need to have a little more patience when dealing with people from a different cultural background. We had to have a number of things built for us remotely in India for a while (which, incidentally, was not entirely successful) [...], so I ended up Skyping with someone every week. For him it was late in the day, for me early. You sometimes have to ask additional questions: What exactly do you mean? Can you repeat that? This is also because the accent is different than what you hear on TV here. Sometimes you get confused and think: We were supposed to have a Skype meeting, right? Only to find out that it was a holiday there.”

ALUMNUS INTERVIEW, MAY 2015

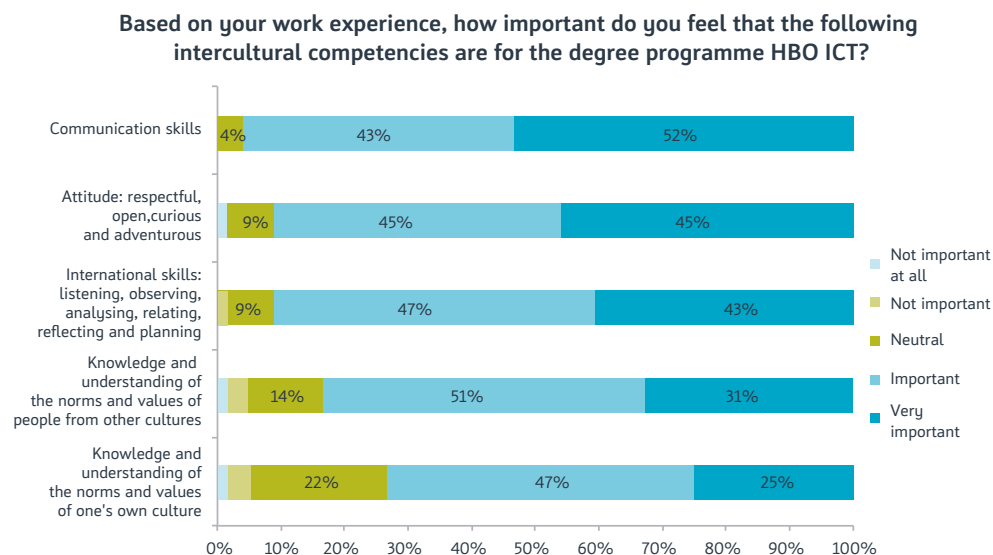


Figure 14: Importance of intercultural competencies for HBO ICT according to alumni

Intercultural competencies are considered second most important after language knowledge and personal and social competencies. The top three intercultural competencies are communication skills (4.48), attitude (4.35) and international skills (4.32). Slightly less important, but still important, are knowledge and an understanding of the norms and values of people from other cultures (4.07) and one's own cultural values and norms (3.92).

"In our industry, outsourcing has become extremely popular, especially to countries like India and China and, nowadays, also South American countries. They work in a completely different way than we are used to in the Netherlands. That sometimes demands quite a bit of patience. [...] I think what it primarily boils down to is understanding. I notice in myself, as well as others, that you cannot do anything about these cultural differences. It's simply a part of who you are. It's just the way it is and you need to be able to deal with it. You especially need understanding when working with other cultures."

ALUMNUS INTERVIEW, MAY 2015

Based on your work experience, how important do you feel that the following international academic and professional competencies are for the degree programme HBO ICT?

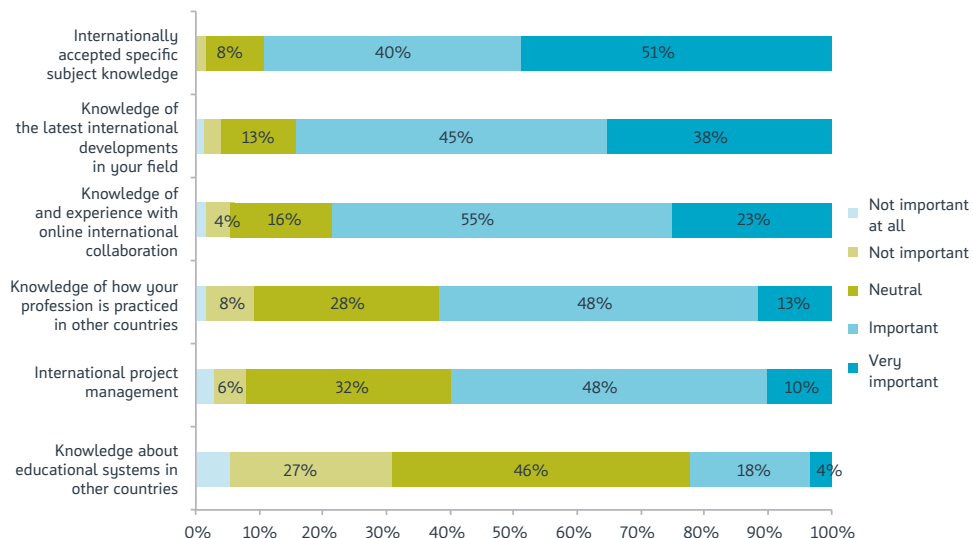


Figure 15: Importance of international academic and professional competencies for HBO ICT according to alumni

Of the international academic and professional competencies, internationally accepted specific subject knowledge (4.42) and knowledge of the latest international developments in your field (4.17) are considered important to very important. These are followed by knowledge of and experience with online international collaboration (3.97). Knowledge of how your profession is practiced in other countries (3.64) and international project management (3.56) received scores of neutral to important. Knowledge about educational systems in other countries (2.88) is considered considerably less important.

“What matters is that you’re able to quickly grasp the other culture, to understand how to deal with it and be truly open to it. Genuinely understanding that YOU are the one who needs to adapt is important, since the company is certainly not going to adapt to you. These are simply very important matters to keep in mind.”

ALUMNUS INTERVIEW, MAY 2015



What kind of subject knowledge is international?

Internationally accepted subject knowledge is considered very important. To assess whether the current availability of subject knowledge within the degree programme is sufficiently internationally oriented, respondents were asked to indicate what kind of subject knowledge (methods, techniques, tools) is accepted internationally. The input for every degree programme is given below. The terms mentioned most often are shown in a larger font.

Business IT & Management



Figure 16: Subject knowledge for BIM most often mentioned by alumni

Other terms mentioned: Six Sigma, EPC, ITSM, COSO, COBIT, TMAP, Jira, Tosca, SAP, Oracle, DevOps, PMP, PMI, kennis in XML taal, Gateway, Henderson & Venkatraman, IPMA

Other aspects mentioned in more general terms are that it is important to analyse and describe processes, make business cases, certification in various aspects of the field, everything related Corporate Social Responsibility, open and other standards, outsourcing and programming languages. It was also mentioned that is important to know which tools are used internationally, but it is difficult to say which ones exactly since this is different for every field and sector. It was also mentioned that it is important to understand why some suppliers are so successful on the international level, while others are only active in the Netherlands, such as Baan vs. Oracle & SAP.

Information Technology



Figure 17: Subject knowledge for Information Technology most often mentioned by alumni

Other terms specifically mentioned were .net, PHP, JavaScript, html, css, Objective-C, Swift and Cassandra. Knowledge of international standards was also mentioned frequently, such as the use of ISO standards (especially ISO 9002 and ISO 27k1), IEEE standards and standards related to web services: WS-I, Soap, XML, web standards, W3C project management standards, Unicode and C standard. Certifications mentioned were Microsoft certification, VMware certification and Cisco CCNA certification. Also mentioned once: MSP, MoR, JSD, Yourdon, HL7, DICOM, SOAP, ITSMF, building and approaching APIs – server management, open source projects, IPMA, PMI, TOGAF, development processes like eXtreme Programming, CMM, Database knowledge: SQL, PL/SQL, test-driven development, continuous integration, xp development, Service Oriented Architecture, Cloud, GIT version management and products from international companies like Oracle, SAP and HP.

“One of the things I find lacking in others are competencies related to delivering quality. Especially when working with different cultures, the quality of the code or design of databases and documentation is one of the most important factors to be able to continue working. If I’m writing a specific type of code and include it in our source management, no one except me will understand it. Working with documentation and according to standards is what keeps our team up and running. This includes checking the code, reviewing it. We work a great deal with GIT and before we publish something in our general framework, it first needs to be assessed by two other people before it can even be accepted. That is something I learned outside my degree programme.”

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Other comments made:

- “There was considerable focus on PRINCE2 in the programme, while PMBOK (although comparable) is primarily used in America. In my opinion, ITIL receives too little focus in the programme. Considerable attention is devoted to ASL, which is very useful for application management but (still) relatively unknown internationally, while ITIL is used extensively for technical management around the world and should therefore receive a lot more attention.”
- “Perhaps it would be interesting to hear more about a Gartner. One of my colleagues obtains a lot of information from this.”
- “Organisations like IEEE and ACM have documentation on the requirements a degree programme should meet on the international level.”
- “None. Everything. International competencies and knowledge are utter nonsense; all of my professional knowledge can be used abroad. The culture and etiquette may differ, but those kinds of things are extremely difficult to teach without experiencing them in real life. It is difficult *not* to work internationally, considering all the forums and mailing lists. All of the skills in the list below that I’m to rate seem to me to be very important nationally as well.”
- “The entire programme, everything I learned during the Information Technology programme (like Java), is known internationally.”

Information Services & Management



Figure 18: Subject knowledge for IDM most often mentioned by alumni

Other terms mentioned: PMBOK, Kanban, International Project Management Association (IPMA), MoP, MSP, PGM, SPM, ASL, BISL-Strategic IT alignment and waterfall, UDC code, international standard for describing publications and images and objects, language agreements for database entries, standardised thesauri or keyword list, Dublin Core, APA style, archiving methods and global standards, record-keeping/management, linked data information literacy, semantic languages and repositories, IMS Enterprise, IMS Content Packaging, SCORM, Common Core and metadating, ICT, social media, cultural knowledge, Microsoft certified Professional (numerous variations), Certified Information Professional (AIIM), important international IT developments like cloud solutions, HTML and marketing principles like AIDA, working with PowerShell scripts and knowledge of CMS programs like Kentico, SharePoint.

Computer Science

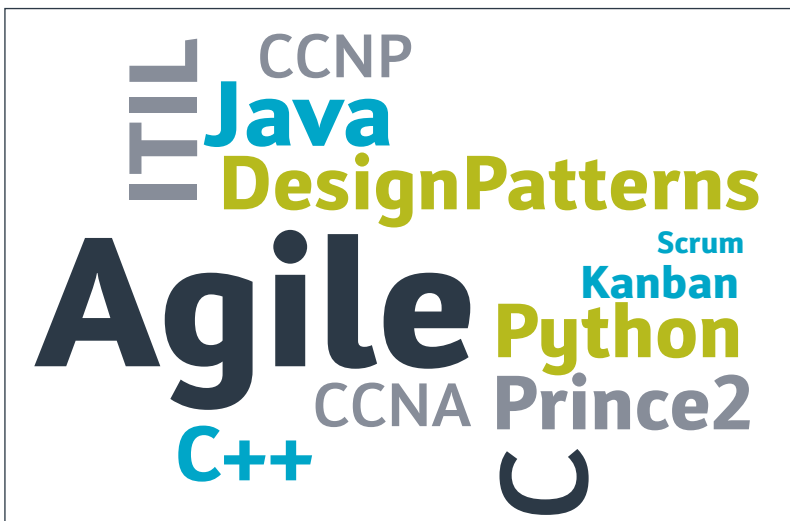


Figure 19: Subject knowledge for Computer Science most often mentioned by alumni

Terms also mentioned: JavaScript, CPerl, Ruby and modern languages like Scala, Erlang, Clojure and F#, Verilog, FPGAs, Lean, RUP, formal test techniques (especially Tmap), requirements for engineering and source systems like SVN/Git, ISO, COBIT, Microsoft, International standards like S88,S95,S99 and ISO 9001:2008 ISO 9000:2005 ISO 9004:2009, PHP; PSR, vendor-specific certifications and subject (not vendor-specific) certifications are important. CEH, CCIE, JNCIS, ISTQB certification for business analyst & project management certificates. Also mentioned were MCSA, MCSD, RHCA RHSCA and CISSP, BigData, SaaS, PaaS, social media, Mobile, Microsoft Operating Systems, security techniques,

side channel analysis, fault injection, LAMP, XAMPP, Linux, *BSD, TOGAF, reverse engineering, version control, static code analysis/metrics, ASM ARM/MIPS/x86/AMD64, code quality; unit testing, TDD, continuous integration, coding guidelines, continuous delivery, software metrics and quality assurance tools (Sonar, etc.), DSLs, networking, virtualisation and modelling servers with UML and Enterprise Architect, ShapeChange for generating XSD, NodeJS, MongoDB software development, database models and database development.

“Looking at other universities, there is considerable pressure for students to earn certain types of certification, such as Cisco and Microsoft certification. Those kinds of certifications are actually more important abroad than a degree from a Dutch university of applied sciences. Our universities are unfamiliar to them, while certification has an international standard that they can test.”

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Finally, the following comments were also made:

- “In my opinion, all subject knowledge within ICT is international.”
- “So far, I’ve encountered little that is only relevant in the Netherlands. Programming languages, fundamental computer science and professional literature are all shared internationally.”
- “Computer Science includes Global Software Development with slogans like Follow the Sun, Near-shoring, and so on. You can also focus on the technical aspects of solutions like information hiding and design patterns. You can also recognise technical quality by applying software metrics.”
- “Programming languages are international. The questions above do not refer directly to an ICT environment in which there are no longer any country borders. The language of communication at ICT companies and knowledge sharing has been English for many years now.”

Information Technology and Information Science

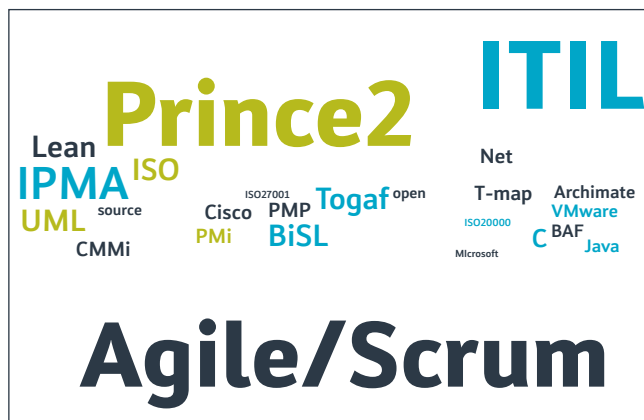


Figure 20: Subject knowledge for I&I most often mentioned by alumni

Also mentioned: CMM, RUP Object Oriented Modeling, SQL, IFX, MSP, ISACA certificates: CISA, CRISC, CGEIT and those of ISC2: CISSP, RBAC. Identity&Access Management security, Cobit, COSO/ERM, PMBOK, ANSI, BPMN, IEEE, ITAR, ASL, Cooper Stagegate, MSCE, ETSI, OSI SNIA, data storage, data security and data management, knowledge of databases like MSSQL, Citrix, Service Oriented Architecture and knowledge of standards like RFCs, PHP, SQL, mobile development, web development, JavaScript frameworks (for the web), HTML and Visual Studio 2013, language knowledge, understand-

ing of other cultures and ways of working, IT knowledge in general and business administration. Terms and procedures within logistics (import/export), communication, customs and taxes, administration.

Finally, a number of respondents made comments that cannot be categorised under specific topics, but that are relevant all the same:

- “There is no national or international in ICT. It is everywhere. All IT in the Netherlands is international and if it originates in the Netherlands, it has an international target group.”
- “What kind of subject knowledge is purely Dutch? Nothing in ICT, as far as I know.”
- “All basic knowledge is important for a degree programme in the field of IT (which is technical). This often involves subjects related to architecture (infra, application, data, etc.) and subjects that create a bridge between IT and Business (requirements analysis, communication skills, etc.).”
- “I think that the Open Source world shows the way here. Projects are often carried out on the international level and talented individuals work on them remotely and asynchronously. There is support because responsibility is shared. OpenID Connect, AngularJS, Git, etc.”
- “Compared to other countries, the educational level in the Netherlands is on a very high level. Let’s not forget that.”

Based on your work experience, how important do you feel that knowledge about other countries is for the degree programme HBO ICT?

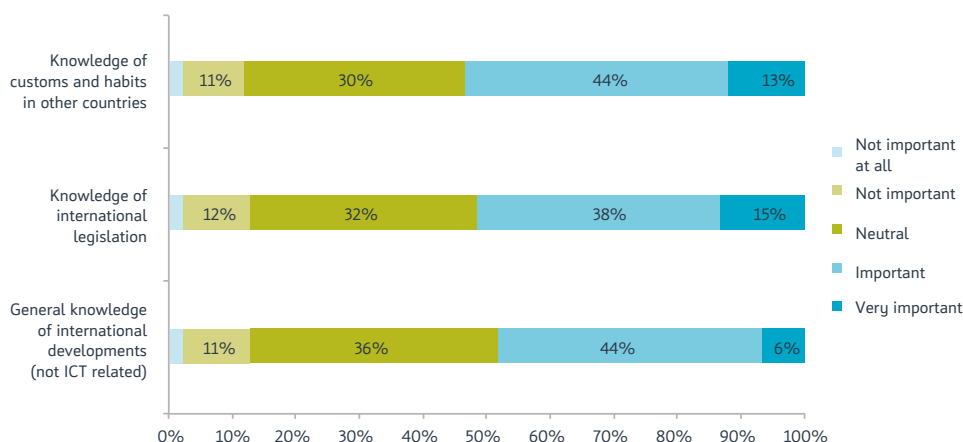


Figure 21: Importance of knowledge about other countries according to alumni

Knowledge of other countries is generally considered to be less important. Knowledge of customs and habits in other countries (3.54), knowledge of international legislation (3.53) and general knowledge of international developments not related to ICT (3.42) are considered neutral to important.

Many respondents did not answer the question: “Which competencies do you feel are lacking in the above list?” Many of the answers were examples of competencies already formulated, especially in the ‘soft skills’ categories: intercultural competencies, knowledge of other countries and personal and social competencies. Since it provides quite a bit of insight into how these competencies are needed in the world of ICT, the examples for each competencies are listed below.

Intercultural competencies

Attitude: respectful, open, curious and adventurous:

- Positive attitude, ability to negotiate
- Not afraid of a challenge
- Patience and perseverance
- Inquisitiveness
- Respect for the individual
- Professionalism, punctuality, preparation, saying what you do and doing what you say
- Making an impact
- Dedication: 150% effort is expected at foreign locations. Afterwards, colleagues go home to their families and you continue working or go back to your hotel room exhausted. It helps if you have a hobby that you can also do abroad, like playing sports or enjoying nightlife.

National and international skills: listening, observing, analysing, putting things into perspective and reflecting and planning:

- Ability to listen

Communication skills:

- Explaining or clarifying something to the other international party about your own culture or attitude. Mirror knowledge: how the other person sees you. After all, this is what you consider the 'norm' and that norm does not exist in an international world.
- Ability to adapt and empathise in terms of other styles, communication skills in an international atmosphere
- Appropriate interaction
- Communicating in an international and multicultural team
- Giving and receiving feedback. An example of this is reviewing a code and confronting someone about his development approach if it does not meet the standard. The ability to handle the same type of criticism after you finally get something up and running after much blood, sweat and tears.
- Dealing with people from another culture, managing conflict situations (an Italian deals with this differently than a German)
- Showing respect and making sure you do not immediately have an opinion on how business is conducted in another country
- Being diplomatic

Knowledge and understanding of one's own cultural values and norms:

- Modesty, awareness of how the Dutch are different than most other people
- Not being conceited or pedantic

Knowledge of the values and norms of people from another culture:

- Understanding other cultures, specifically those of India and China
- Knowledge of the work culture in other countries.

Knowledge of other countries

Knowledge of customs and habits in other countries:

- Specific knowledge of etiquette in other countries. Examples: the role of personal space in Japan, how business cards are exchanged in Japan or that a Belgian may come across as timid but, before a Dutch person realises it, suddenly becomes terribly angry. I gained this kind of knowledge partly from classes and partly from personal experience. You can help students avoid these kinds of faux pas by devoting attention to them. I know that junior professionals with this kind of knowledge in starting positions are taken seriously more quickly.
- The position of women in other cultures is not always the same as that of men

General knowledge of international developments not related to ICT:

- Insight into financial markets, internationally
- Knowledge of political developments
- International conflict management

Interpersonal and social competencies

Taking initiative

- Networking

Flexibility

- Ability to adapt and accept
- Patience: ability to deal with flexible scheduling and that agreements are not always cast in stone
- I would like to clarify flexibility: working internationally (as well as locally) demands flexibility, but you need to be sure you do not violate the frameworks related to, for example, the interests of your own organisation
- Flexibility: adapting, going along with another culture, working method, communication
- Responding quickly

Independence/self-reliance

- A skill I find lacking in all university graduates is the ability to start up for themselves. I call this being a self-starter: you start at a company and succeed in 'delivering' before long. I absolutely blame project-driven education for the fact that this skill is lacking. This ability to be a self-starter is less and less every year. Graduates need to be able to carry out all necessary steps independently.
- Strong sense of responsibility for yourself and your work

Ability to work in international and multicultural teams:

- Not all competencies are learned from a book; considerable experience is needed to understand what it really means to work with different time zones, planning and working with different ethics (how you respond to it and since theory differs from practice)
- Establishing steps and joint evaluations, so that everyone has the same materials
- Shared ownership, letting others share in your success
- Being concise, to the point and goal-oriented
- Dealing with conflict: this is often a problem in Dutch students and other teams because much irritation goes unspoken, which frustrates the group process. The likelihood of this happening is much greater in an international team and it can also take longer before the cause is clear. It is very important to communicate this and develop understanding without the problem escalating.
- Location awareness: I often have to call American suppliers, one on the west coast and one in the Midwest. But this requires adapting your schedule and sometimes even your working hours to different time zones.
- Influencing/organising and achieving How you assign tasks, how you follow up, how you deal with fraud
- Managing distributed teams
- Knowledge of supporting collaboration and other techniques
- Communication technique teamwork
- Giving feedback and keeping people up-to-date on the situation

Table 3: Grouping of international competencies submitted by respondents

A few responses that did not fall directly under one of the competencies above:

- Leadership: developing a vision, motivating, taking charge/managing². Awareness of your strengths and weaknesses, asking for help, especially knowing what you are able or not yet able to do.
- Travel experience, general fitness, being away from home.
- Creativity: ability to come up with out-of-the-box ideas in order to arrive at mutual understanding.

.....
2 This competency is included in the survey for graduate supervisors

The chart below shows the average score for the degree of importance for every competency and degree programme. This makes it possible to emphasise different aspects of each differentiation in the development of the HBO ICT degree programme. The scores that are above average are indicated by a green box and those below average are indicated by a red box. It appears as if the somewhat older I&I programme from which alumni graduated many years ago and the alumni of the BIM programme generally score above average, while INF and TI are generally below average. But the scores are so close together that it can hardly be called a difference.

Language knowledge	BIM	INF	IDM	ISM	TI	I&I	Total
English reading skills	4.68	4.68	4.43	4.00	4.58	4.71	4.67
English listening skills	4.76	4.60	4.43	4.00	4.58	4.71	4.63
English speaking skills	4.62	4.43	4.37	4.00	4.35	4.60	4.48
English writing skills	4.57	4.39	4.35	4.00	4.51	4.52	4.47
Other language	3.11	3.00	3.35	3.00	2.90	3.20	3.11

Interpersonal and social competencies	BIM	INF	IDM	ISM	TI	I&I	Total
Ability to work in international and multicultural teams	4.30	4.15	4.09	4.00	4.06	4.25	4.15
Independence/self-reliance	4.47	4.24	4.46	4.00	4.34	4.45	4.38
Empathy: putting yourself in someone else's shoes	4.34	4.05	4.17	4.00	4.00	4.33	4.19
Flexibility	4.43	4.31	4.39	5.00	4.15	4.44	4.35
Taking initiative	4.38	4.20	4.33	4.00	4.18	4.27	4.27

Intercultural competencies	BIM	INF	IDM	ISM	TI	I&I	Total
Attitude: respectful, open, curious and adventurous	4.45	4.33	4.39	5.00	4.17	4.39	4.35
International skills: listening, observing, analysing, putting things into perspective and reflecting and planning	4.47	4.27	4.36	5.00	4.06	4.40	4.32
Communication skills	4.63	4.40	4.53	5.00	4.30	4.54	4.48
Knowledge and understanding of your own cultural values and norms	4.07	3.64	4.13	5.00	3.75	4.06	3.92
Knowledge and understanding of the values and norms of people from other cultures	4.39	3.88	4.07	5.00	3.81	4.23	4.07

International academic and professional competencies	BIM	INF	IDM	ISM	TI	I&I	Total
International project management	3.60	3.31	3.80	3.00	3.38	3.73	3.56
Knowledge of and experience with online international collaboration	4.07	3.77	4.11	4.00	3.85	4.07	3.97
Knowledge of how your profession is practiced in other countries	3.64	3.55	3.78	5.00	3.62	3.66	3.64
Knowledge of the latest international developments in your field	4.09	4.19	4.18	5.00	4.09	4.24	4.17
Knowledge about educational systems in other countries	2.95	2.75	3.04	3.00	2.87	2.85	2.88
Internationally accepted subject knowledge	4.47	4.55	4.26	5.00	4.35	4.39	4.42

Knowledge of other countries	BIM	INF	IDM	ISM	TI	I&I	Total
Knowledge of customs and habits in other countries	3.67	3.35	3.73	4.00	3.28	3.68	3.54
General knowledge of international developments not related to ICT	3.67	3.20	3.58	4.00	3.21	3.47	3.42
Knowledge of international legislation	3.63	3.49	3.62	4.00	3.36	3.53	3.53

Table 4: Importance of international competencies per degree programme

The HBO Monitor also has a question about which international competencies are needed in the current position. The graph below shows that personal and social competencies rank clearly at the top, followed by international professional and academic competencies and, finally, language competencies. A total of 24.9 per cent of respondents indicated that no international competency was needed for their current job. This differs from the findings of the survey into international competencies held among alumni. Possible reasons for this:

1. International competencies are not required until later in the career and/or
2. Those who completed the questionnaire about international competencies are already more 'internationalisation-minded' and/or
3. The HBO Monitor does not further clarify the term international competencies, so it is possible that respondents are not entirely clear what this means.

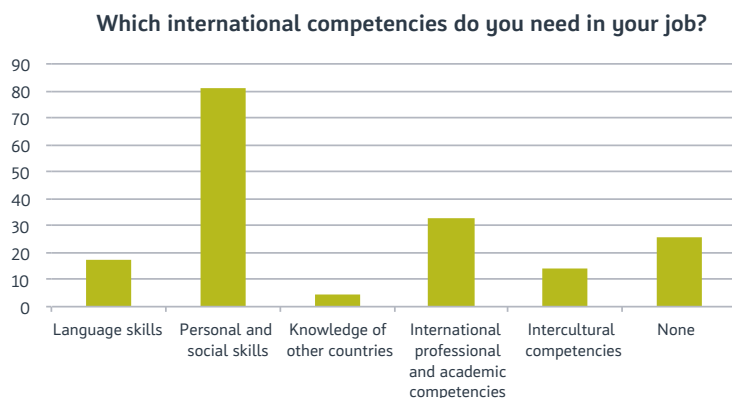


Figure 22: International competencies required for work (HBO Monitor 2013)

“Certain competencies are always important, whether you work nationally or internationally.”

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The online survey held among ICT alumni, the HBO Monitor and interviews showed that the following international competencies are considered important to very important: English language skills, comprising reading, listening, speaking and writing skills. Personal and social competencies are considered important to very important, comprising independence/self-reliance, flexibility, taking initiative, empathy and the ability to work in international and multicultural teams. Intercultural competencies are also considered important to very important. Considered most important of these are communication skills, attitude, international skills and knowledge and understanding of the values and norms of people from other cultures. Of the international academic and professional competencies, only internationally accepted subject knowledge is considered important to very important, as well as knowledge of the latest international developments in the field. Knowledge of other countries received a neutral rating.

Alumni suggestions as to what kind of subject knowledge is internationally accepted and a description of how important a competency is for each degree programme provides input on the differentiation level in developing the HBO ICT programme.

3.2.3 Which international competencies are important to graduate supervisors?

The online survey for alumni provided insight into the kinds of competencies that are important based on the experiences of alumni. The responses from graduate supervisors are given below in order of importance.

Based on your work experience, how important do you feel that language skills are for the new degree programme HBO ICT?

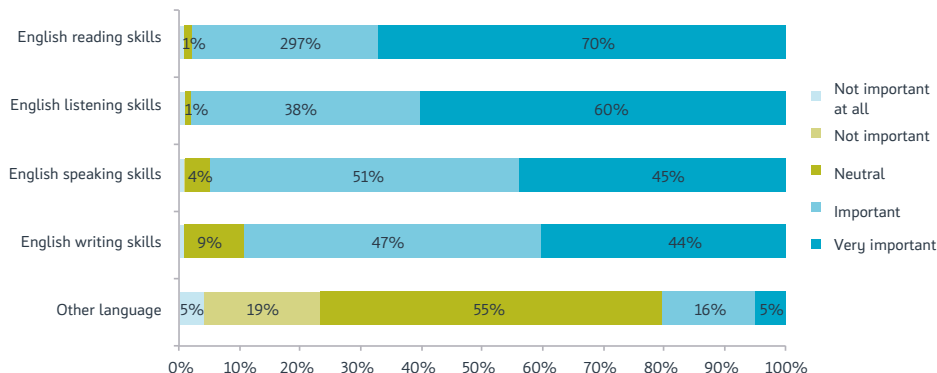


Figure 23: Importance of language knowledge for HBO ICT according to graduate supervisors

English language skills, including reading (4.67), listening (4.58), speaking (4.39) and writing skills (3.34), are considered important to very important. Mastering another language (2.97) received neutral responses.

Based on your work experience, how important do you feel that intercultural competencies are for the new degree programme HBO ICT?

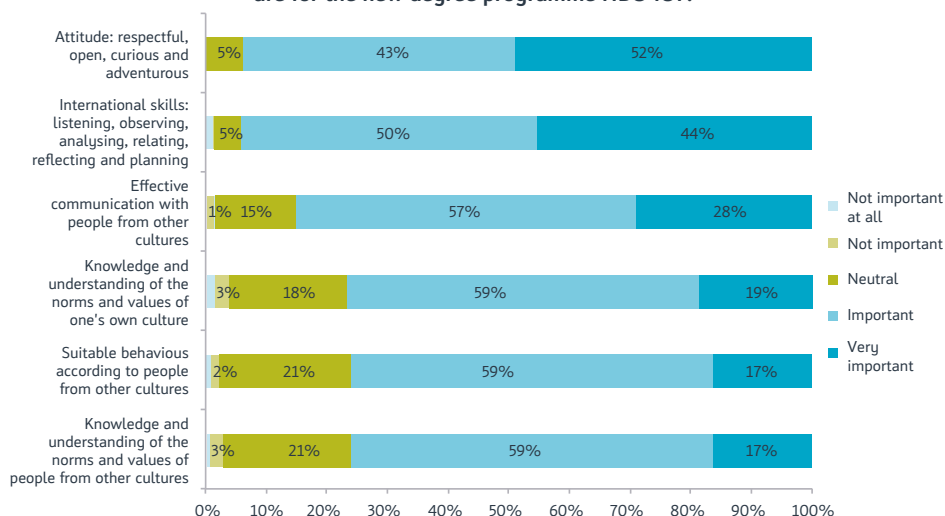


Figure 24: Importance of intercultural competencies for HBO ICT according to graduate supervisors

Intercultural competencies are also considered important to graduate supervisors. Competencies considered important to very important are attitude (4.47), national and international skills: ability to listen, observe, analyse, put into perspective and reflect and plan (4.38) and effective communication with people from other cultures (4.12). Graduate supervisors gave a neutral or important rating for knowledge and understanding of own cultural values and norms (3.91), suitable behaviour in the eyes of people from other cultures (3.90) and knowledge and understanding of the values and norms of people from other cultures (3.87).

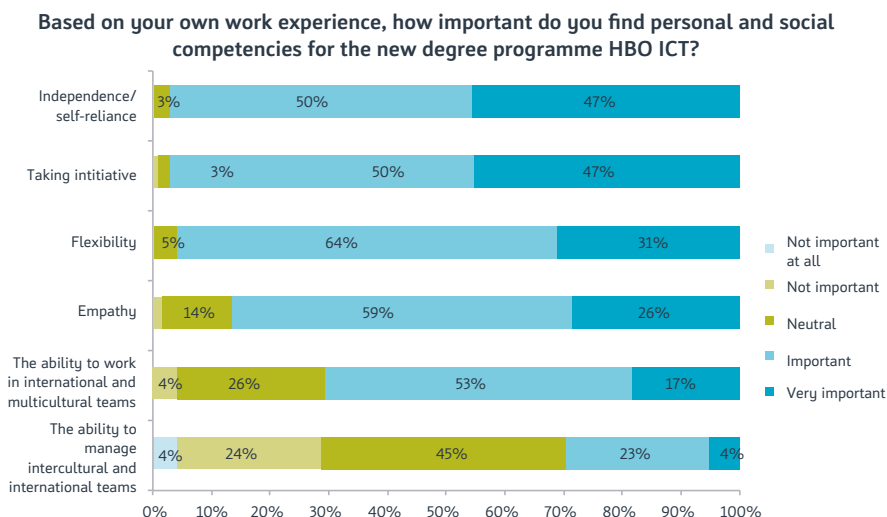


Figure 25: Importance of personal and social competencies for HBO ICT according to graduate supervisors

Personal and social competencies are considered important to very important, comprising independence/self-reliance (4.44), taking initiative (4.43), flexibility (4.26) and empathy (4.10). The ability to work in international and multicultural teams was rated neutral to important (3.83) and the ability to manage international and multicultural teams was rated neutral to unimportant (2.98).

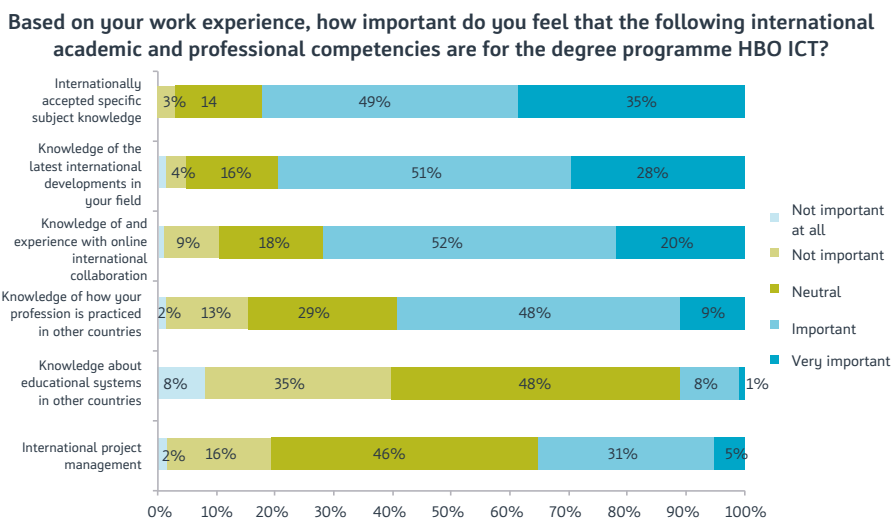


Figure 26: Importance of international academic and professional competencies for HBO ICT according to graduate supervisors

Graduate supervisors consider internationally used subject knowledge (4.15) and knowledge of and experience with the latest international developments in the field (4.01) to be important to very important. Knowledge of and experience with online international collaboration (3.82), knowledge of and experience with how the profession is practice in other countries (3.48) and international project management (3.22) received between a neutral and important rating. Knowledge of and experience with educational systems in other countries received between a neutral and unimportant rating (2.58).

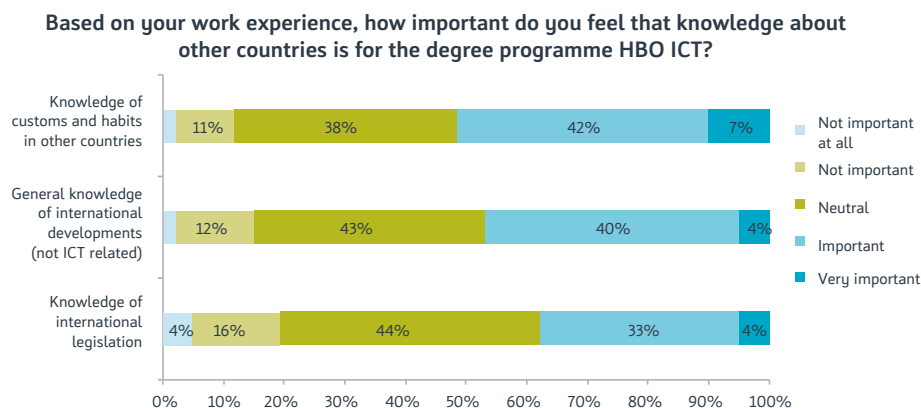


Figure 27: Importance of knowledge of other countries for HBO ICT according to graduate supervisors

When asked about knowledge of other countries, graduate supervisors responded with a neutral to important rating. From highest to lowest: knowledge of customs and habits in other countries (3.41), knowledge of international developments not related to ICT (3.30) and knowledge of international legislation (3.16).

The international competencies that graduate supervisors found important to very important were first and foremost the four aspects of English language skills. Of the personal and social competencies, independence/self-reliance, taking initiative, flexibility and empathy are considered important to very important. Intercultural competencies are considered important to very important and, in particular, communication skills, attitude and international skills. Of the academic and professional competencies, as with alumni, internationally accepted specific subject knowledge and knowledge of the latest international developments in your field are considered important by graduate supervisors.

The competencies considered least important by graduate supervisors are knowledge of and experience with education systems in other countries, languages other than English and the ability to manage international and multicultural teams.

3.3 How should international competencies be embedded in the curriculum of the new HBO ICT degree programme?

To progress from insight into which international competencies are important to the kinds of changes that should be implemented in the curriculum, it is important to consider the competencies that are already mastered in the current curriculum. This is discussed in section 3.3.1. Alumni were also asked what they believed was the best way to implement changes. This is discussed in 3.3.2.

3.3.1 To what degree do the current degree programmes contribute to the development of international competencies among students?

The online survey for graduate supervisors not only contains a question as to which competencies are important, but also how students score in those competencies considered important by the end of their degree programme and during the graduation phase. This comparison provides the degree programme with input regarding which competencies should receive more attention compared to the previous curriculum.

For every competency that was considered important or very important (average score between 4 and 5), it was then examined how the graduate supervisors feel about how our graduates score for those competencies. The graduate supervisors were asked to rate these on a five-point scale: 1-2, 3-4,

5-6, 7-8, 9-10. The 'degree of appreciation by graduate supervisor' column shows the score in bold, while the score on the Likert scale on which the rating is based is given between brackets.

Competency	Degree of importance		Degree of appreciation by graduate supervisor
	Alumni	Graduate supervisors	
Language knowledge			
English reading skills	4.67	4.67	7 (3.83)
English listening skills	4.63	4.58	7 (3.79)
English speaking skills	4.48	4.39	6.5 (3.52)
English writing skills	4.47	3.34	6.5 (3.45)
Intercultural competencies			
Communication skills	4.48	4.12 ³	6 (3.26)
Attitude	4.35	4.47	7 (3.66)
International skills	4.32	4.38	6.5 (3.42)
Knowledge and understanding of the values and norms of people from other cultures	4.07	3.87	6 (3.22)
Knowledge and understanding of one's own cultural values and norms	3.92	3.91	6.5 (3.41)
Interpersonal and social competencies			
Independence/self-reliance	4.38	4.44	6.5 (3.51)
Flexibility	4.35	4.26	6.5 (3.57)
Taking initiative	4.27	4.43	6.5 (3.45)
Empathy	4.19	4.10	6 (3.33)
Ability to work in international and multicultural teams	4.15	3.83	6 (3.22)
Professional and academic skills			
Internationally accepted subject knowledge	4.42	4.15	6 (3.36)
Knowledge of the latest international developments in your field	4.17	4.01	6 (3.27)

Table 5: Assessment (score and Likert scale score between brackets) by graduate supervisors of the international competencies considered important to very important by alumni and graduate supervisors

³ In the online survey for graduate supervisors, communication skills are described as effective communication with people from other cultures.

The table below shows that fourth-year ICT students do not score too highly for international competencies (score 6 out of 10). They achieve the score 7 (highly satisfactory) for the two international competencies considered most important by alumni and graduate supervisors: English reading and listening skills. The competency 'attitude' also scored 7 (highly satisfactory). Other competencies considered important earned a more limited satisfactory score. So these competencies should receive more attention in the new curriculum.

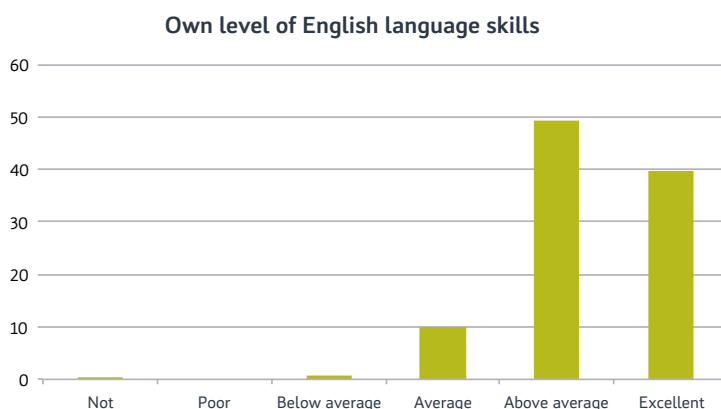


Figure 28: Own English language level indicated by alumni (HBO Monitor)

In the HBO Monitor, 49.2% of alumni indicated that their own English language level is above average, while 39.7% of alumni assess their own level to be excellent and 9.9% average. The assessment of their own English language level by alumni is therefore slightly higher than the 6.5/7 score given by graduate supervisors for the English language mastery level of graduates. This finding corresponds to the results of other studies (Funk et al., 2014).



Figure 29: International competencies acquired during the degree programme (HBO Monitor)

The HBO Monitor (data only available for the years 2012 and 2013 and completed by 64 respondents) shows that 78.1% of respondents indicated that they have primarily acquired personal and social competencies during their study programme, while 23.4% of respondents indicated that they have acquired international professional and academic competencies and 17.1% language competencies.



Figure 30: International competencies that alumni missed during the degree programme (HBO Monitor)

In the HBO Monitor, 47.2% of respondents indicated that the degree programme did not teach them international professional and academic competencies, while 32.1% indicated that language competencies were lacking, 24.5% of respondents did not learn intercultural competencies and a tenth of respondents indicated that they did not learn personal and social competencies or country knowledge. These results show that the level of English is considered highly satisfactory to good, but the students do not necessarily acquire this language competency during the degree programme. This is confirmed by the interviews with alumni: ICT students are often active in international games or international forums, enabling them to develop their English language skills. A third of the group, however, would like more attention paid to language competencies in the degree programme. For intercultural competencies, respondents to the HBO Monitor indicated that they did not acquire any intercultural competencies during their programme and a quarter would have like to be taught these. According to graduate supervisors, graduates receive a 'satisfactory' to 'highly satisfactory' score for this aspect. Students probably acquire these competencies through informal interaction with a diverse student population. The largest group indicated to have acquired personal and social competencies during the degree programme and only a tenth of respondents indicated wanting to have learned these skills. All the same, graduate supervisors rate these competencies as 'satisfactory'. Nearly half of respondents indicated that they did not acquire international professional and academic competencies and a fourth indicated having acquired these. All in all, the assessment of the graduate supervisors of the degree to which ICT graduates master international competencies is 'satisfactory'.

3.3.2 What changes should be implemented in the HBO ICT curriculum to meet the demand for international competencies?

We now have an overview of which international competencies are considered important and the degree to which alumni have acquired these competencies based on the current curriculum. To gain insight into how changes can be implemented, alumni were presented with a number of ideas on how international competencies could be integrated into the education. They were asked to indicate on a five-point scale how worthwhile they find these ideas (very worthwhile - completely worthless).

We have a number of ideas about how we can integrate international competencies into the education. Which of the following proposals do you find worthwhile?

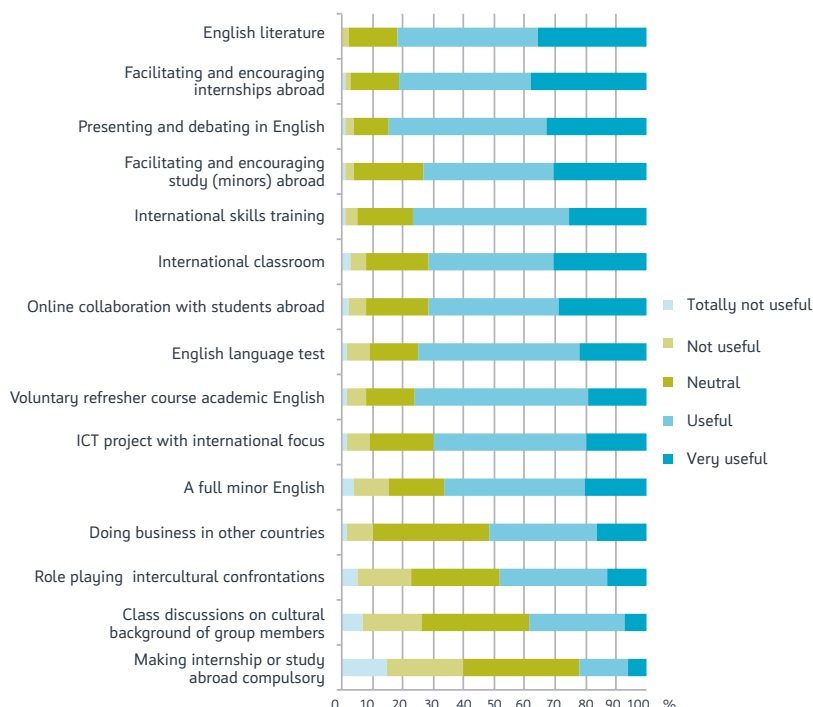


Figure 31: Usefulness of possibilities to internationalise curriculum

The graphic below shows that alumni consider English-language professional literature (4.15) and presenting and debating in English (4.13) to be worthwhile to very worthwhile. They also feel it is very important that students experience and develop international competencies in practice. A work placement (4.15) or studying (3.98) abroad or in an international classroom (3.91) or collaborating online (3.90) with international students are preferable to role-playing with regard to intercultural confrontations (3.34) and class discussions that examine the various cultural backgrounds of classmates (3.13).

In the survey you considered role-playing with regard to intercultural confrontations to be 'not worthwhile'? Could you explain that? Answer: "I find it too fake. You learn this through practical experience. Take this French intern at my company, for instance. He was simply placed here and has to figure out for himself who we are and what we do. This is a great way to learn. It shows him what the Dutch are like. I think that if I had to role-play this situation, it wouldn't have any added value."

ALUMNUS INTERVIEW, MAY 2015

A mandatory work placement or study abroad was rated 'not worthwhile' to 'neutral' (2.73).

"You can simply do a work placement in an international company here in the Netherlands, where lots of international aspects converge. In other words, you don't necessarily have to go abroad for that."

ALUMNI INTERVIEW, MAY 2015

The Computer Science degree programme at the Delft campus is the only programme that not only includes English-language professional literature in the curriculum, but also specific English classes. The table below shows that the level of English language of TI Delft students was rated higher than for students in the TI The Hague, BIM, INF and IDM programmes. The T-test, however, shows that the difference is not significant (independent T-test with a significance level of 0.05).

Question: "I've heard you mention several times in this interview that English is so important. In the online survey, you gave a 'neutral' rating for a volunteer refresher course. What did you mean by that?" Answer: "It's voluntary, right? That's why I rated it 'neutral'. It would be better if it were mandatory."

ALUMNUS INTERVIEW, MAY 2015

Average score of own level of English language per degree programme

Programme	Average score for own level of English language	Number of valid responses
Computer Sciences in Delft	4.16	23
Information Security Management	4.00	1
Computer Science for Business	3.75	97
Information Services & Management	3.70	27
Information Technology	3.68	69
Computer Sciences in The Hague	3.62	23

Table 6: Average score of own level of English language per degree programme

"Holding classes in English also helps prevent frustrating translations of technical terms"

ALUMNI IN HBO MONITOR

The responses given in the HBO Monitor answering the question: "Do you have any suggestions for the education given at The Hague University of Applied Sciences in terms of international competencies?" primarily concern suggestions related to improving the English. The essence here is that English should be taught in an integrated fashion (subject lessons in English, international work placement or studies) and not as separate classes.

"When giving advice at the helpdesk, I talk to students from all kinds of degree programmes. The advice I often give them is that they need to look in English-language databases. Students often respond that they prefer to search in Dutch, but you find much more information in English-language databases, so if you only search the Dutch ones, you're limiting yourself tremendously."

ALUMNUS INTERVIEW, MAY 2015

4. Discussion

To be able to interpret the results within the context of the HBO ICT degree programme, it is important to examine what steps have been taken towards internationalisation within the ICT programmes. Following this description, a number of important results from Chapter 3 in relation to the degree programmes are discussed.

Before the 2012 academic year, special attention was devoted within the programmes to personal and social skills, but without specifically placing them within an international context. A great deal of English-language professional literature has always been used in all of the programmes. At TI Delft, classes are taught in English. There have been foreign exchange contracts with foreign institutes, but students only took advantage of these to a limited extent. To facilitate international placements for students, the Check-IT collaboration project was launched in 2008. Check-IT offers a work placement hub at a software park in Xiamen, China, where Dutch students work together with Chinese students in project groups on a placement assignment for a Chinese company. At first, only one or two students took advantage of this opportunity, but the maximum limit of five students per semester has been reached several times in recent years. As regards internationalisation@home, an international semester was organised a number of times between 2008 and 2010. Foreign students could take part in this as part of an exchange programme and Dutch students could opt for this as an elective in their Minor programme. Since it was an elective for Dutch students, only a limited number of students took part in this.

A new faculty internationalisation policy plan in 2012 once again drew attention to internationalisation in the various degree programmes. The ISM programme, for instance, chose to offer Major courses in English so that foreign students could take part and Dutch students could work in international project groups and improve their English language skills. INF and, starting in September 2015 also TI, have decided to offer a Minor block in English. The BIM and INF programmes have also experimented with online international collaboration projects. The BIM, INF and IDM programmes decided to devote more attention to English language skills in the Major and BIM also developed an intercultural skills module. The number of exchange contracts has increased significantly ever since. Students who acquired international skills during their programme in keeping with the 2012 policy are going to be graduating this year, so it is not likely that the effect of the 2012 internationalisation policy was measured in this study.

The first thing that is noticeable in the results from Chapter 3 is that international skills are considered very important within the ICT sector. In order of importance: language knowledge, personal and social skills, intercultural competencies, international academic and professional skills and country knowledge. A comparison with the study carried out by Funk et al. (2014) shows that, with the exception of country knowledge, more people within the ICT sector consider all international competencies to be important to very important than people in other sectors. This high score is due to the fact that the subject matter is international and the fact that a large number of alumni has worked abroad (25 per cent) or for an internationally oriented company (29 per cent) at some point.

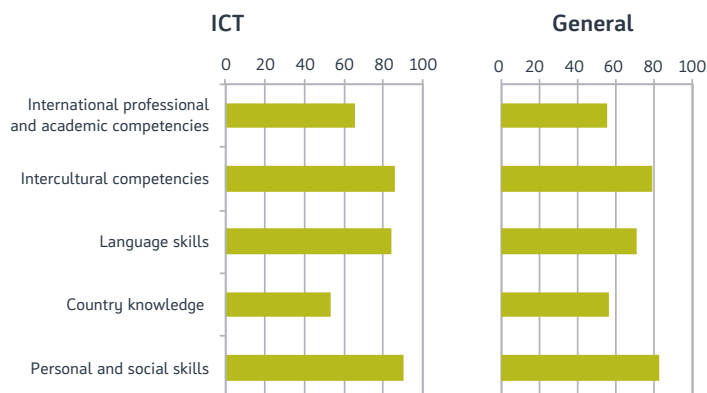


Figure 32: The percentage of respondents who responded 'important' or 'very important' for each competency; a comparison between the results of this study (ICT) and the general study conducted by Funk et al. (2014).

Another noteworthy result is that alumni and graduate supervisors feel very strongly about English language skills. Alumni and graduate supervisors consider all aspects of the English language to be important to very important. Despite the fact that few English classes have been given to date within the degree programmes, alumni feel that their own level of English is average to excellent. Offering English-language professional literature and the way in which students develop their English language skills alongside their studies is apparently already sufficient for the ability to function in English. Respondents in the HBO Monitor, however, did not indicate a significantly higher level for the only programme that explicitly involves English classes: TI. Yet a number of programmes decided in 2012 to devote more attention to the development of English language skills. This decision is also in line with the desire of alumni: nearly 30 per cent indicated that they did not learn language competencies from their degree programme.

The limited attention to international competencies in the curriculum before 2012 is reflected in the scores from the HBO Monitor in which close to 80 per cent of alumni indicated that they primarily acquired numerous personal and social skills during their programme, but not intercultural competencies.

The score given by the graduate supervisors for the degree to which graduates have mastered international competencies by graduation is between 6 and 7. This is actually 'satisfactory' to 'highly satisfactory', but it is up to the degree programme to determine the ambition level. The instructions state that respondents can leave a question blank if they are unable to assess the competency. The comments field and inquiries show that some respondents gave an average score of 5-6 if they were unable to assess a competency instead of leaving it blank. So the actual score may be slightly more extreme if the instructions would have been clearer (a score above 5.5 higher and a score below 5.5 lower). This would mean a higher score for all international competencies that are considered important to very important.

Finally, there does not appear to be a significant difference in the importance of international competencies per ICT degree programme. In other words, every specialisation of the HBO ICT can devote attention to international skills in the same way. It should be noted here, however, that there was only one respondent from the ISM degree programme. This may be due to the fact that the ISM programme was launched in 2008 and does not yet have many alumni. The value of the input for this specialisation is limited as a result.

5. Conclusions and recommendations

In the conceptual framework for internationalisation of the curriculum (2015), Leask places disciplinary knowledge in the centre of the model. In this study, alumni and graduate supervisors provided input on the process of internationalising the curriculum. Based on these results and hands-on experiences the internationalisation team of HBO ICT has developed the internationalisation toolkit: a compilation of relevant instruments that can be used to internationalise the curriculum. This chapter describes how the results for every competency set have been included in the internationalisation toolkit and, finally, a number of recommendations are given to promote the internationalisation process within the Faculty.

Language competencies: This study found that English and English listening and reading skills in particular are considered tremendously important. Alumni believe that they have personally mastered the English language sufficiently enough to perform and this is confirmed by the assessment of the graduate supervisors: graduates received a 7 (highly sufficient) for English listening and reading skills. As the internationalisation toolkit prescribes: much English-language literature is offered within the HBO ICT and this will be continued in the future. During the first semester, a formative English language test will be given. Students that are firmly under the B1 (European reference framework) level will be given the opportunity to take English classes. Students between the B1 and B2 level or higher master the language sufficiently to improve their language skills to the B2 level during the programme. This study shows that students have a good command of the English language, but often need to overcome a certain degree of anxiety. Since students work together in project groups with international students during the third or fourth year, they have the opportunity to learn to overcome this anxiety. Students will also have to hold a presentation in English or debate in English occasionally during their major programme.

Intercultural and personal and social competencies are considered very important, but our graduates score 'sufficient' (score 6, 6,5 and 7 out of 10). To master these competencies, students need to learn through experience. Collaborating in international teams can facilitate this, but you also learn the necessary skills by simply working in teams in the Netherlands, as long as supervision is provided specifically with regard to intercultural and personal and social competencies. PREFLEX is a training programme aimed specifically towards this and offers the basis for a module in the HBO ICT toolkit⁴. This study shows that it is not preferable to learn intercultural and personal and social competencies through role-playing or class discussions in which reference is made to various national and international cultures. The study World Citizenship by Belt et al. (2015) shows that ICT alumni differ from other students in this regard.

Of the international academic and professional competencies, internationally accepted subject knowledge is considered especially important. Our alumni score just sufficiently (6) in these. "A programming language that only works in Dutch is yet to be developed." Methods and techniques used in ICT are international and the programme effectively prepares HBO ICT students in terms of subject knowledge for international professional practice. The list that states internationally accepted subject knowledge for each specialisation can be used by educational developers within the HBO ICT programme. If a choice can be made between a nationally or internationally oriented topic, the internationally oriented topic is preferable. Internationally accepted subject knowledge stated repeatedly for all specialisations: Prince2, ITIL and Agile/Scrum. The Scrum and Prince2 topics are included in the HBO ICT toolkit.

Country knowledge is considered relatively less important or is too specific to be included in an HBO ICT degree programme. It will not be given separate attention unless a student is going abroad to study or for a work placement. The student would then desire more information on the country.

⁴ The HBO ICT toolkit is a compilation of at least 15 small modules of around 1 EC each that the specialisation can place within their own context through additional education and assignments that correspond to the specialisation. It was the source of inspiration to create the internationalisation toolkit.

A recommendation is to organise a focus group meeting. Based on this study, an overview has been gained of which international competencies are important and how alumni and graduate supervisors feel attention can be devoted to them. It would benefit the degree programme to organise a focus group meeting based on these research results in which students, lecturers, alumni, graduate supervisors and representatives meet to convert the results into an action plan for the development of the curriculum for the HBO ICT programme. A focus group meeting is not only a good way to make the right choice, but also to generate support among those involved (Leask, 2015). The outcome of this report and the outcomes of the focus group meeting should be discussed in the HBO ICT curriculum board meeting. Furthermore, it is recommended to evaluate every intervention and take note of its impact. The ICT degree programmes already implemented more far-reaching internationalisation in 2012, the impact of which has not yet been measured. Another recommendation is to analyse the HBO Monitor in coming years to determine whether there is a difference in the degree to which alumni who were taught the post-2012 curriculum believe that they have acquired or failed to be taught international competencies. This can provide valuable input.

To finalise this report with Lisa Childless' remarks: internationalising curricula is a matter of all levels of the organisation. From institutional board to management to teachers to students. This report is expected to play a role in creating the support of all involved.

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REFLECTION

In the vision document 'World citizens in a learning society' of The Hague University of Applied Sciences priority is given to the themes World Citizenship, Internationalisation, Networking University and Quality.

On the themes World Citizenship and Internationalisation Anneke conducted last year's research on the international competencies of our alumni from the perspective of the IT work field.

The research of Anneke is of importance for the Faculty of IT & Design. It indicates the importance of Internationalisation and World Citizenship in the policy of our Faculty, in relation to the institutional policy.

Some remarkable findings in the report:

- 25 per cent of our HBO ICT alumni actually work abroad now and
- 93 per cent of our alumni indicate they have to deal with internationalisation in one way or another
- More ICT alumni consider international competences 'important' to 'very important' than alumni of THUAS institution wide
- The most important international competencies alumni mention are: English language skills, interpersonal and social skills (ability to work in international and multicultural teams; independence/self-reliance; empathy; flexibility; taking initiative), intercultural skills (attitude: respectful, open, curious and adventurous; international skills: listening, observing, analysing, putting things into perspective and reflecting and planning; communication skills; and knowledge and understanding of the values and norms of people from other cultures) and knowledge on the latest international developments in the field of ICT.

These research findings form valuable input in the development of the new curriculum of HBO ICT.

I would like to thank Anneke for her dedication in conducting the research and her perseverance to achieve her goals.

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The Hague, 7 October 2015